INST. ENT. LIBRARY
29 JUN 1931

The Florida Entomologist

Official Organ of the Florida Entomological Society

Vol. XV SPRING NUMBER No. 1
APRIL, 1931

SOME NEW GENERA AND SPECIES OF LEAFHOPPERS RELATED TO EUTETTIX VAN DUZEE *(Rhynchota Homoptera)*

By E. D. BALL
University of Arizona, Tucson

The genus *Eutettix* Van Duzee has like most other Jassid genera been made a catch-all for a number of widely different groups of leafhoppers, with little in common other than a transverse furrow behind the vertex margin. As fixed by its type *lurida* Van Duzee this genus consists of a small group of about twelve North American species of rather large heavy bodied leafhoppers with short heads and definite transverse furrows, simple venation without reticulations, vermiculations or supernumerary costal veinlets. The other groups that have been placed here may be separated by the following key:

A. Large heavy bodied species with short obtuse heads and a definite transverse furrow, venation simple, usually a black band on face or an ivory area on commissure or both. —1. *Eutettix* Van Duzee

AA. Smaller and more slender species with more conical heads and the transverse furrow less conspicuous or wanting—usually with reticulations or extra veinlets or both; often with an intricate "saddle" pattern.

B. No extra veinlets to costa (the costal area may be reticulate.)

C. Species relatively plain without "saddle", usually small. —2. *Opsius* Fieber

CC. Species with intricate saddle pattern usually larger and broader. —3. *Norvellina* Ball

BB. Costal veinlets increased in number and expanded towards apex. —4. *Menosoma* Ball

EUTETTIX GONIANA n. sp.

Size and form of *subaenea* nearly with a short broad vertex as in *lurida*. Brownish straw with a black line on vertex margin. Length 4.5-5 mm.

Vertex broader and shorter than in *lurida*, more than three times wider than long, margins nearly parallel, dorsum sloping and rounding over to front with only a trace of the depression; front extremely wide at base, as wide as the median length. Elytra about as in *lurida* with similar vena-

tion except that the claval nervures are joined by a cross nervure. Female segment broadly roundingly notched with a strap-shaped median tooth longer than in *lurida*.

Color: uniform pale tawny or brownish straw, the elytra sub-hyaline with the dark tergum showing through and giving a smoky cast. Below pale yellow. A narrow black line just above the white vertex margin ending in the ocelli, a still narrower line on the face just below the vertex margin in the male; a hair line of black between the vertex and pronotum and sometimes a shorter one on scutellum.

Holotype ♀ allotype ♂ and 5 pairs of paratypes taken by the writer at Patagonia, Arizona, September 7, 1929. This species resembles *aurata* in the lines margining the vertex but is much larger and quite distinct.

EUTETTIX GLENNANA n. sp.

Resembling *subaenea* but with a shorter, broader vertex. Creamy with smoky brown elytra and four black spots. Length ♀ 6 mm ♂ 5 mm.

Vertex, scarcely longer on middle than against the eyes, two and one-half times wider than long, evenly rounding in front, with a definite transverse depression between the ocelli. Elytra long and narrow, much exceeding the abdomen, the second apical cell very broad, nearly three times as broad at base as the first and third. Female segment rounding posteriorly with a shallow excavation and a broad strap that exceeds the length of the segment. Male plates extremely long, roundingly narrowing then attenuate, four or more times the length of the triangular valve.

Color creamy above and below. The elytra smoky subhyaline, iridescent with a coppery reflection and a faint ivory spot on the commissure. Vertex with four black spots on anterior margin, two round ones just inside the ocelli and two oblique ones between these, the latter reduced in the male. Scutellum with two black points on each side dividing the lateral margins into three equal parts. Sutures on lower part of face narrowly black lined, front smoky with light arcs.

Holotype ♀ allotype ♂ and 1 female paratype taken by the writer at Glenn Oaks, Arizona, October 7, 1929.

GENUS OPSIUS FIEBER

This genus was erected for *stactogalus* Amyot, an introduced species first found in this country in Texas and described as *Eutettix osborni* Ball, but now distributed from coast to coast. *E. clarivida, insana, paupercula, tenella* and *stricta* are here considered as belonging to this group.

GEN. NORVELLINA n. gen.

Resembling *Eutettix* in the transverse depression on vertex and single cross nervure; much narrower and trimmer in build with definite pattern or saddle markings.

Vertex much broader than long, almost parallel margined, broadly rounded or slightly angulate with front. Head with

the eyes equalling the pronotum or folded elytra in width. Pronotum decidedly longer than the head and much less produced in front than in *Platymetopius* and its allies. As seen from the side, the pronotum is strongly arched and sloping down in front, the vertex sloping in the same curve until just before the apex where there is a definite horizontal shelf which extends from eye to eye, anterior margin bluntly rounding and almost right-angled with face. Elytra closely folded at rest. Venation simple, regular, only one cross nervure, no true costal veinlets except the two at the ends of the first apical cell. Elytra covered by a "saddle" pattern made up of contrasting colors and reticulations.

Type of the Genus *Eutettix mildredae* Ball

This genus embraces some twenty or more largely western species of which *Eutettix seminuda* Say and *chenopodii* Osb. are the common eastern representatives. From *Eutettix*, sensus strict, they are readily separated by the saddle pattern the vermiculate reticulations and the narrower lighter form. The genital pattern is simple and of relatively little value in either group.

NORVELLINA OREGONA n. sp.

Resembling *pulchella* in form and saddle markings but much smaller and darker with heavy vermiculations on the ivory areas. Smaller than *helenae* with a more definite saddle. Length ♂ 3.7 mm.

Vertex slightly longer than in *pulchella*, a little longer on middle than at eyes with a deep furrow and a definite margin. Male valve short obtusely triangular, plates long triangular, as in *saucia*.

Color: face and anterior margin of vertex dark fulvous, rest of vertex, pronotum, scutellum and saddle marking dark brown as in *pulchella*, scutellum with a trace of fulvous. The ivory areas with coarse vermiculations and dark brown veins. Margins of saddle not definite as in *pulchella*, and the posterior light bands uniting back of clavus, leaving a broad dark area apically with two round white dots in disc and a large irregular spot near the outer angle.

Holotype ♂ and 1 paratype male taken at Unity, Oregon, July 11, 1927. This is a very distinct species in both size and color marking and warrants description from a single sex.

NORVELLINA HELENAE n. sp.

Resembling *chenopodii* Osb. but much smaller with the much heavier vermiculations somewhat obscuring the saddle. Length 4-4.5 mm.

Vertex proportionally longer than in *chenopodii*, twice wider than long, slightly longer on middle than against eye. Elytra reticulate throughout so that the lighter areas bounding the saddle are coarsely reticulate in-

stead of ivory as in *chenopodii*. Female segment with a broad angular median notch in the apex of which arises a strap-like process as long as wide and slightly bifid at apex. In *chenopodii* the margin is only faintly indented either side the strap. Color brownish fulvous with a fulvous vertex and scutellum, a brown saddle set off by semi-reticulate ivory areas. Face and below sordid fulvous.

Holotype ♀ and allotype ♂ Sanford, Florida, June 17, 1926, and 6 paratypes from the same place at various dates all collected by W. E. Stone and the writer near Lake Helen. The writer has material from Florida, Texas, Missouri and Kentucky and is inclined to believe that this small species replaces *chenopodii* throughout the entire cotton belt.

NORVELLINA APACHANA n. sp.

Resembling *bicolorata* but smaller and with obscure markings throughout. Size and form of *nevada* but less heavily marked. Pronotum, scutellum and an oblique spot on apex of elytra heavily irrorate with brown, the saddle very obscure. Length 4-4.5 mm.

Vertex shorter than in *saucia* which it otherwise resembles, twice wider than long, scarcely longer on middle than against eye. Front narrower and less inflated than in *saucia*, much less than in *bicolorata*. Female segment rounding posteriorly, deeply triangularly excavated with a broad strap-like projection. Male plates long, triangular as in *saucia*.

Color: face and vertex pale creamy, the latter with three to five irregular irrorations on posterior half. Pronotum ivory, heavily and irregularly irrorate with brown. Scutellum almost solid brown with 7 white spots around the margin. Elytra with a very obscure saddle marking of pale brown, a brown wash over the ivory areas, a dark spot some distance back of the cross nervure on either side and a third one at apex of clavus. The vermiculations become more definite before the long oblique apical spot.

Holotype ♀ allotype ♂ and seven paratypes, Granite Dell, Arizona, August 17, 1929, and six paratypes Glenn Oaks, Arizona, October 9, 1929, all taken by the writer.

MENOSOMA n. gen.

Resembling *Eutettix* and *Norvellina* in general form and structure, but lacking the transverse depression on vertex and possessing a number of transverse or oblique veinlets to costa. Vertex broad, obtuse, sloping, usually little longer on the median line than against eye, as seen from side, rounding over to front to form an obtusely conical apex. Front broad and relatively short, much broader at base than in Eutettix. Pronotum longer than vertex the anterior margin evenly rounding, side margins moderately long. Elytra as in *Eutettix*. The venation simple, second cross nervure absent. The claval veins tied together and often connected with the suture. The outer anteapical cell angu-

larly expanded in the middle and narrowing posteriorly. The two outer apical veinlets reflected and expanded on the costa, three or four adjacent transverse veinlets with expanded apices along the costa. Sometimes the first cross nervure is doubled or even trebled. The general color is pale or tawny with more or less banding on front, vertex and elytra and a tendency to oval ivory spots in the ends of cells.

Type of the Genus *Menosoma stonei* Ball

This is a distinctly subtropical genus of which a considerable number of species occur in the Central and South American regions. Only four species are at present known from the United States, *M. cincta* widely distributed east of the Rockies and on to South America. *Stonei* from Florida, *tortolita* from Arizona, and *acuminata* Bak from the Southwest. *Athysanus litigiosus* Ball from Mexico also belongs here.

MENOSOMA STONEI n. sp.

Smaller than *cincta* with a shorter vertex. Pale tawny without bands. Length 5 mm.

Vertex definitely shorter than in *cincta*, almost parallel margined, more obtusely conical in profile. Female segment similar but slightly shorter than in *cincta* male genitalia similar. Color pale tawny, the elytral nervures red except for the reflexed ones along costa which have broadly fuscous ends.

Holotype ♀ September 16, 1925, allotype ♂ August 31, 1926, and twelve paratypes taken from May 5 to October 1 at Sanford, Florida, by W. E. Stone and the writer. This very distinct little species is named in honor of Mr. W. E. Stone whose inexhaustible energy was equally displayed in his economic and systematic work in this area.

MENOSOMA CINCTA var. BINARIA n. var.

Form and structure of *cincta* nearly but with the dark color intensified until it appears to be almost black with a broad white band. Length 5.5 mm.

Vertex slightly more angled than in *cincta* and the female segment shorter. Color much darker, the vertex and pronotum pale with definite brown or fuscous spots. Elytra milky with a black blotch either side resting on the junction of the claval nervures, two similar blotches near base of costa on either side, back of which is a broad transverse ivory band. The apical half of each elytron is fuscous except for a spot near the apex of clavus and a hyaline area running in from the outer apical cells.

Holotype ♀ Sanford, Florida, September 2, 1927, and two paratype females from the same place, August 30, 1926, all taken by W. E. Stone.

MENOSOMA TORTOLITA n. sp.

Structure of *stonei*, larger and darker, larger than *cincta* with definite dark and light bands on vertex margin. Length 5.5 to 6.5 mm.

Vertex, twice wider than long, almost parallel margined, slightly angled with front instead of rounding over, front very broad and flat. Prontoum long, nearly twice longer than the vertex, with a long straight lateral margin. Elytra longer and narrower than in *cincta* or *stonei*. Resembling genus *Scaphoideus* in form and venation. Outer anteapical cell long and narrow usually divided and sometimes triplicated. Female segment rather short on lateral, margins, the posterior margin produced into a triangle: male valve just visible behind the segment, plates together deep spoon-shaped with blunt apices.

Color dark tawny with black on face and apex of elytra. Vertex with the anterior and posterior margins white lined. Another white line, slightly angled, behind the anterior one, these white lines separated or set off by fuscous ones. Front, clypeus and lorae black, an angled or wavy white line a little more than its own width below the margin and about five pairs of short light arcs on front. Pronotum and scutellum irregularly mottled. Elytra pale with dark brown veins and brown clouds in the cells, becoming fuscous towards the apex. These clouds omit a number of oval and round ivory spots.

Holotype ♀ allotype ♂ and a pair of paratypes taken at Patagonia, Arizona, September 7, 1929 by the writer.

FLORIDA ENTOMOLOGICAL SOCIETY

Meeting, March 27, 1931

The regular monthly meeting of the Florida Entomological Society was called to order by President Byers. There being no business, the meeting was turned over to Professor T. H. Hubbell who gave a very interesting talk on the group of cave-crickets or camel crickets (Order Orthoptera), discussing their geographic distribution and theories as to their evolution and migrations. An interesting feature of the program was the many examples drawn from other groups of animals and plants to show similarities in geographic distribution. This group seems to further substantiate the theory of an old Antarctic land mass connecting South America, Africa and Australia. The talk was well illustrated with maps, data, and specimens of various species of camel crickets.

Dr. Byers then gave a brief discussion of C. H. Kennedy's paper entitled "Evolutionary Level in Relation to Geographical, Seasonal and Diurnal Distribution of Insects" which was published in Ecology IX, 4, 367, 1928.

Adjourned at 5:10 P.M. L. W. ZIEGLER,
Approved April 24, 1931 Secretary.

The
FLORIDA ENTOMOLOGIST
Official Organ of The Florida Entomological Society, Gainesville, Florida.

Vol. XV, No. 1 April, 1931

J. R. WATSON.....*Editor*
WILMON NEWELL.....*Associate Editor*
H. E. BRATLEY.....*Business Manager*

Issued once every three months. Free to all members of the Society.

Subscription price to non-members is $1.00 per year in advance; 35 cents per copy.

EUVANESSA ANTIOPA Linn.

THE MOURNING CLOAK

A specimen of this striking butterfly was caught by the author about two miles east of Gainesville on February 1st, 1931. There were a few willows growing in the rather boggy place where it was found. In February of 1917 Professor Watson (in Florida Entomologist, Vol. 1, No. 1, page 6,) saw, but was unable to capture, one two miles west of Gainesville near what is known as Hog Town Creek.

These are the only known records of the Mourning Cloak this far south in Eastern United States. John A. Grossbeck, in the Bulletin of the American Museum of Natural History, Vol. XXXVII, in a list of Florida Lepidoptera, mentions "Northern Florida", and states "it is very rare", also "two specimens were seen in 1887 by Johnson at St. Augustine". St. Augustine is about fifteen miles further north than Gainesville and on the Atlantic Coast.

Therefore, the conclusion is drawn that the range of *Euvanessa antiopa* extends but a short distance into Florida from the North, altho some of its host plants, such as willows, extend to the tip of the peninsula, and elms and hackberry (*celtis*) are common about Gainesville. The presence of its eggs, larvae, or pupae have not been known to the author in this region. The two specimens found may have migrated from the North.

H. E. BRATLEY.

INSECT ENEMIES OF THE COTTON BOLL WEEVIL[1]

By EDGAR F. GROSSMAN

During the summer of 1927, the writer visited a number of cotton fields in Florida, Georgia and Alabama, with the express purpose of determining the abundance of the insect enemies of the cotton boll weevil (*Anthonomus grandis* Boh.). Infested cotton squares were collected from sixteen representative fields and forwarded to the insectary at Gainesville, Florida, where the boll weevils and their parasites were hatched and recorded[2].

In 1930 the experiment was repeated. Cotton squares were collected from twenty-four fields, three of which (Alachua, LaCrosse and Tallahassee) were visited twice in order to determine whether or not the number of parasites increased during a three-week period. The total number of parasites recovered was extremely low, 47 having hatched from 11,559 cotton squares whereas, in 1927, 387 parasites were recovered from 8,451 squares. There were fewer boll weevils also, 1,609 or 13.9 percent emerging from 11,559 squares as compared with 2,453 or 29.0 percent emerging from 8,451 squares in 1927. The cotton yield, however, was practically the same as that of 1927, ranging from one-quarter to three-quarters bale per acre. Two of the fields were poisoned, one four miles north of Americus, Georgia, and the other six miles south of Madison, Florida, but an appreciable gain in the cotton yield was not obtained. The field at Americus, however, yielded but few boll weevils and parasites and the one at Madison yielded none.

The field at Tallahassee, Florida, which was visited on July 22, and again on August 15, showed an appreciable reduction in boll weevil infestation though no parasites were recovered. The field at LaCrosse, Florida, showed a slight increase in weevil infestation and decrease in number of parasites recovered, and the field at Alachua yielded fewer weevils and parasites on August 5 than on July 16. As a consequence of these tests, no definite indication of an increase or decrease in parasitism during this three-week period was obtained. The dry weather prevalent throughout the cotton belt during the summer of 1930 undoubtedly checked both weevil and parasite propagation, though the recovery of so few parasites may also be ascribed, at least in part,

---

[1]Contribution from the Department of Cotton Investigations, Florida Agricultural Experiment Stations.

[2]Edgar F. Grossman, "Control of the Cotton Boll Weevil by Insect Enemies". Science, No. 1787, Vol. LXIX, pp. 361-62. March, 1929.

to the relatively light weevil infestation of 1929 which would bring about an ebb in the parasitic cycle. Messrs. Fenton and Dunnam[3] also found a reduction in the number of parasites which were recovered in 1925, when fewer specimens were recovered than in 1924 or 1926.

1927

Locality	Date collected 1927	Squares examined	Boll weevils hatched	Parasites hatched	Percent hatched boll weevils	Percent hatched parasites
Campbellton, Fla.	July 30	190	119	1	62.63	0.53
Americus, Ga.	July 7	765	381	7	49.80	0.92
Greenville, Fla.	Aug. 1	405	190	37	46.91	9.14
LaCrosse, Fla.	July 18	540	207	35	38.33	6.48
Thomasville, Ga.	July 5	450	170	0	37.78	0
Bonifay, Fla.	Aug. 1	390	135	5	34.62	1.28
12 Mi. S. of Dothan, Ala.	July 30	413	137	80	33.17	19.37
Alachua, Fla.	July 18	900	282	58	31.33	6.44
6 Mi. S. of Greenville, Fla.	Aug. 1	402	102	3	25.37	0.75
4 Mi.W. of Campb'l't'n, Fla.	July 30	348	87	16	25.00	4.60
Hurtsboro, Ala.	July 9	1100	266	18	24.18	1.64
4 Mi. N. of Madison, Fla.	July 29	376	75	18	19.95	4.79
Dothan, Ala.	July 30	316	56	9	17.72	2.85
Columbus, Ga.	July 8	900	150	8	16.67	0.89
5 Mi. N. of Madison, Fla.	July 29	574	83	24	14.46	4.18
6 Mi. S.E. of Madison, Fla.	July 29	382	13	68	3.40	17.80

1930

Alachua, Fla.	July 16	342	194	10	56.73	2.92
7 Mi. E. of Tallahassee, Fla.	July 22	319	166	0	52.04	0
Newberry, Fla.	Aug. 5	242	121	4	50.00	1.65
5 Mi. S. of Americus, Ga.	July 23	285	118	5	41.41	1.75
Asheville, Fla.	Aug. 15	23	9	0	39.13	0
Madison, Fla.	Aug. 15	173	61	0	35.26	0
LaCrosse, Fla.	Aug. 5	343	117	1	34.11	0.29
LaCrosse, Fla.	July 16	740	238	6	32.16	0.81
Alachua, Fla.	Aug. 5	368	118	8	32.07	2.17
Gainesville, Fla.	Aug. 8	207	43	0	20.77	0
4 Mi. N. of Americus, Ga.	July 23	402	69	4	17.16	0.99
7 Mi. E. of Tallahassee, Fla.	Aug. 15	654	112	0	17.13	0
Graceville, Fla.	July 25	452	69	0	15.27	0
Troy, Ala.	July 24	468	35	1	7.48	0.21
Union Springs, Ala.	July 24	761	55	7	7.23	0.92
4 Mi. E. of Graceville, Fla.	July 25	709	38	1	5.36	0.14
Bonifay, Fla.	July 25	445	13	0	2.92	0
Caryville, Fla.	July 25	447	12	0	2.68	0
Albany, Ga.	July 23	527	10	0	1.90	0
Thomasville, Ga.	July 23	513	5	0	0.97	0
5 Mi. E. of Madison, Fla.	July 22	232	2	0	0.86	0
Sneads, Fla.	July 25	562	3	0	0.53	0
Hurtsboro, Ala.	July 24	475	1	0	0.21	0
6 Mi. S. of Madison, Fla.	July 22	540	0	0	0	0
3½ Mi. W. of Madison, Fla.	July 22	535	0	0	0	0
6 Mi. W. of Columbus, Ga.	July 24	318	0	0	0	0
Campbellton, Fla.	July 25	477	0	0	0	0

There is a natural variation in the percent parasites which are recovered from year to year in the same vicinities and the uniform scarcity of parasites during 1930 is to be expected to occur occasionally. Whether or not this scarcity will tend to precede a year of severe boll weevil damage during the time re-

[3]F. A. Fenton and E. W. Dunnam, "Biology of the Cotton Boll Weevil at Florence, S. C." Tech. Bul. 112, U.S.D.A. 1929.

quired for the parasites to rebuild their population is problematic. Though the insect enemies of the boll weevil undoubtedly control this cotton pest to a large degree, the exact extent of their beneficial activities cannot be determined without the inauguration of a more extensive study of their population and dissemination.

NOTES ON UTAH COLEOPTERA

GEO. F. KNOWLTON

(Continued from Vol. XIV, No. 4, page 77)

Family CURCULIONIDAE

Rhychites bicolor var. **wickhami** Ckll.
Logan, August 12, 1925 (Knowlton).

Ophryastes sulcirostris (Say)
Logan, 1923 (Knowlton).

Sitona hispidulus (Fab.)
Hooper, July 1929 (Knowlton); Logan, April 17, 1923 (Knowlton); Salt Lake City, June 1928 (Knowlton); Tremonton, July 1925 (Knowlton).

Hypera punctata (Fab.)
Hooper, June 1928 (Pack and Knowlton); Logan, July 1929 (Knowlton); Magna, August 1928 (Pack and Knowlton).

Phytonomus posticus (Gyll.)
Lewiston, May 23, 1923 (Knowlton); Logan, June 1923 (Knowlton).

Phyllotrox nubifer Lec.
Sardine Canyon, May 22, 1923 (Knowlton).

Balaninus utensis Csy.
On apple tree at Orem, August 21, 1929 (Pack).

Calendra granaria (L.)
Logan, September 7, 1929 (Pack).

Family SCOLYTIDAE

Scolytus rugulosus Ratz.
Orem, May 1927 (Pack); Provo, May 1927 (Pack).

Dendroctonus valens Lec.
Logan.

A NEW *HAPLOTHRIPS* FROM PANAMA

By J. R. WATSON

HAPLOTHRIPS PANAMAENSIS n. sp.

Female—Length 1.1 mm. General color brown (Sepia, Ridgeway's Color Standards, 1912), abdomen lighter with considerable orange-yellow hypodermal pigment. All tibiae and tarsi primrose yellow, tibial shaded with brown on outer margin. Antennal segments 3 and 4, and apex of 2 deep olive buff. Remainder antennae fuscous.

Head about 1.5 as long as broad. Cheeks slightly arched, converging slightly posteriorly. Dorsal surface smooth. Postocular bristles prominent, dark with hyaline dilated tips, about as long as the eyes. Dorsum with three other pairs of bristles, all small; one posterior and mediad of the postoculars, one near the posterior inner angles of the eyes, and one immediately posterior to the posterior ocelli. Vertex rounded, a small and a minute bristle at each anterior inner angle of the eye. Eyes oval, not protruding, not pilose, occupying about a third of the length of the head, and each about 5-6 as wide as their interval, facets small. Ocelli large, more than twice the diameter of the ocular facets, bordered by large, dark red crescents, anterior directed forward. Mouth cone well rounded at tip, reaching a little beyond the middle of prosternum. Antennae scarcely 1.5 times as long as the head; segment. One concolorous with the head except the lighter base; 2 with the broad pedicel almost black, deep olive buff towards apex; 3 and 4 deep olive buff shaded darker on inner margins; 5-8 abruptly darker, fuscous; usual sense cones present on segment 3; pedicels, of segments 3, 6, and 7, narrow, of 4 and 5, broad and short.

Prothorax but little over half as long as head but (including coxae) over twice as wide as long. Pterothorax with sides nearly straight, converging but slightly posteriorly. Legs of moderate length. Femore dark, sepia, darker than the pterothorax. Tibiae abruptly much lighter. Tarsi with a dark fleck on inner side. Fore tarsus with a slender anteriorly directed tooth.

Abdomen widens gradually to about segment 6, then abruptly rounded to the short, thick tube, which is only half as long as the head and .6 as wide at the base as long. It is somewhat lighter apically.

Measurements—Head, length 0.16 mm., width 0.11 mm.; prothorax, length 0.09 mm., width (including coxae) 0.20 mm.; mesothorax, width 0.18 mm.; abdomen, greatest width 0.20 mm.; tube, length 0.08 mm., width at base 0.05 mm., at apex 0.024 mm.

Antennae:

Segment	1	2	3	4	5	6	7	8	
Length	20	36	36	42	36	35	33	23	
Width	28	23	21	24	22	20	18	11	Microns

Total length 0.23 mm.

Wings rather weak, membrane of fore pair pale brownish yellow; constricted in the middle but not as deeply so as in most species of *Haplothrips*. Four interlocated bristles.

This species is marked by the pale yellow color of all tibiae and tarsi, and antennal segments 3 and 4, the short, wide tube and the clouded fore wings.

Male not seen.

Larva (length 1.1 mm.)—By reflected light, light lemon yellow, prothorax, shaded with brown. Legs, particularly tibiae and tarsi heavily shaded with blackish brown. Anternal segment one concolorous with the head, two heavily shaded with brown in basal half, three light brown with pedicel and tip lighter, 4-7 dark brown.

Described from two females and one larva taken by H. Y. Gouldman, at Inspection House, PQ&CA, Washington, D. C., on Pineapple cuttings from Canal Zone. Type in the author's collection.

VEGETABLE WEEVIL IN FLORIDA

According to the Insect Pest Survey Bulletin for April the Vegetable Weevil has been found in most of the Florida counties west of the Apalachicola River. This insect is invading Florida from the west and has become very destructive to a large number of vegetable crops in Louisiana and Mississippi. The insect is about five-eighths of an inch long, gray in color, mottled with numerous small black areas and with larger light gray spots and lines, two on the posterior halves of the elytra are especially prominent. Near the posterior end of each elytron a rather prominent papilla projects horizontally. The snout is broad and short.

WINTER SURVIVAL OF IMMATURE STAGES OF THE BOLL WEEVIL[1]

By EDGAR F. GROSSMAN

No live stages of immature boll weevils *(Anthonomus grandis* Boh) were found on making a mid-winter examination of a large number of bolls and squares attached to cotton plants which had been plowed up late in the fall of 1927 and subsequently piled together to serve as a windbreak. Numerous live adult weevils, however, were found among the large number of dead weevils, pupae and larvae, which were discovered in the cotton debris. A later examination which was conducted in April also failed to yield live immature forms.

In order to eliminate such factors as predators, parasites and mechanical injury which greatly increase the boll weevil mortality rate during the winter months, a number of cotton squares and bolls were removed from an infested field on November 17, 1928. They were then placed in a low temperature incubator regulated to maintain a temperature of 55°F. and 80 percent to 90 percent relative humidity. The selected temperature and relative humidity conditions were previously determined to be near the optimum[2]. After the cotton fruit had been in the incubator 69, 92, 123, 131 and 139 days, respectively, individual squares and bolls were opened until a live weevil stage was found.

Though the examinations yielded many dead larvae, not a single live one was discovered. Several live pupae, however, were found, two having lived as long as ninety-two days after having been placed in the incubator. Live adults were found after periods of 92, 123 and 131 days, respectively, in the incubator. After 138 days no more live weevil stages were found.

Hinds and Yothers[3] conducted an experiment for determining the effectiveness of cotton bolls as hibernation quarters for the boll weevil and in the experiment tabulated the larvae and pupae found within the bolls. No live stages were found in March, though a few representatives of all stages were found in Feb-

---

[1]Contribution from the Department of Cotton Investigations, Florida Agricultural Experiment Station.

[2]Grossman, E. F. "Some Humidity and Temperature Effects on Development and Longevity". Fla. Ent. Vol. XIV, No. 4, pp. 66-71. Dec. 1930.

[3]Hinds, W. E., and W. W. Yothers. "Hibernation of the Mexican Cotton Boll Weevil". U. S. D. A. Bur. Ent. Bul. 77, pp. 1-106. 1909.

ruary. The earlier months of December and January, however, yielded a large number of live individuals.

In Florida, it is quite probable that the larval stages in cotton squares and bolls fail to develop into adults during the winter months. The late pupal stages in squares and bolls, however, may develop into adults and, unless the winter is severe, emerge along with other adult weevils quitting hibernation. The toughness of the overwintered cotton bolls, however, generally tends to confine the newly hatched adult until it dies. Though abandoned cotton stalks may yield but few additional weevils for a renewed spring infestation, they should nevertheless be destroyed early in autumn in order to remove the favorable hibernation quarters they provide for adult weevils.

SURVIVAL OF IMMATURE STAGES OF THE BOLL WEEVIL IN COTTON SQUARES AND BOLLS COLLECTED IN THE FIELD, NOVEMBER 17, 1928, AND PLACED IN A LOW TEMPERATURE INCUBATOR

Date examined, 1929	Days in incubator	Number Cotton Squares Examined							
			Larvae		Pupae		Adults		Total
		Uninfested	Live	Dead	Live	Dead	Live	Dead	Squares
Jan. 24	69	16	0	26	0	8	0	0	50
Feb. 16	92	449	0	335	2	24	2	47	859

		Number Cotton Bolls Examined							
			Larvae		Pupae		Adults		Total
		Uninfested	Live	Dead	Live	Dead	Live	Dead	Bolls
Jan. 24	69	1	0	0	1	0	0	0	2
Feb. 16	92	6	0	2	0	2	1	1	12
March 18	123	69	0	13	0	22	2	15	121
March 26	131	3	0	0	0	0	1	0	4
April 3	139	88	0	33	0	5	0	6	132

FLORIDA ENTOMOLOGICAL SOCIETY

Meeting, April 24th, 1931

The regular monthly meeting was called by President Byers at 4:00 P.M. There being no business to transact, the program was immediately turned over to the speakers. The subject of the meeting was in the form of a Symposium on the Insects of Florida Ornamentals. Dr. E. W. Berger opened the program with a discussion of the whitefly on Cape Jessamine, California privet and Chinaberry. Professor Watson then gave a discussion of a curculio in the nuts of tung-oil trees, together with remarks on the cicada in the ferneries in the vicinity of Jupiter, Florida. Mr. H. E. Bratley then gave a talk on the Polka Dot Wasp Moth on oleanders and the Phyllanthus caterpillar on the Phyllanthus. Both of these insects are proving great pests of their respective hosts in the southern half of peninsular Florida. This program was followed by an informal discussion by members led by Dr. Byers.

Those preseent included members Bratley, Byers, Grossman, Bess, Dickey, Watson and Berger, and visitors Miller, McClanahan, Kea, and Lawless.

L. W. ZIEGLER,
Secretary.

THE SIX-SPOTTED MITE

The outstanding entomological development of the spring in the citrus groves has been a heavy infestation of the six-spotted mite. The infestation is heaviest in Polk County where there has been a general yellowing of grapefruit leaves and considerable dropping, but the outbreak is general in a belt extending entirely across the State from Pinellas County on the Gulf to Brevard on the Atlantic. South of this belt including the Manatee section the mites, tho present, are much less numerous and north of this belt, including Lake and Volusia Counties, only an occasional tree has been attacked. Mr. Thompson at Lake Alfred was able to get a satisfactory kill even during the unusually cool weather of April, either by spraying with lime-sulphur or dusting with sulphur. The unsatisfactory results many growers reported were mostly due to poor coverage; failure to cover the under surface of the leaves with the spray or dusting during windy weather.

PERSONALS

Dr. W. S. Blatchley left his winter home at Dunedin for Indianapolis early in April.

Professor T. H. Hubbell expects to spend the summer in the Museum of the University of Michigan.

The energetic secretary of our society will be married in June.

KALO

NON-ARSENICAL INSECTICIDES

KALITE. The quick killing dust ready to use for most chewing insects, such as beetles and worms. Contains a special prepared fluosilicate which gives high insect toxicity, exceptional plant tolerance, great covering and adhesive qualities. Economical to use.

KAOLITH. A fluorine spray, especially valuable for fruits, such as apples and peaches. Recommended in Florida for celery and tomatoes. A companion spray to Kalite dust. (Note. Neither Kalite or Kaolith contains arsenic, lead or copper. No arsenical residue)

KALOIL. A self spreading, free flowing pyrethrum contact spray. Needs no soap. Special oxidized sulphonated oil spreader and activator, increases efficiency and lowers cost. Gives results in Florida when nicotine can not be used.

It will pay you to investigate. Ask the State Entomologists.

THE KALO COMPANY, Quincy, Illinois

Printing for All Purposes

Carefully Executed

Delivered on Time

Pepper Printing Company

Gainesville, Florida

We recommend the goods advertised in The Florida Entomologist. Please mention Entomologist when you write our advertisers.

RED ARROW INSECT SPRAY

(A Pyrethrum Product)

NON-POISONOUS

DEATH TO INSECTS

WILL KILL

Mexican Bean Beetle, Bean Leaf Roller, Leaf Hoppers, Ants, Aphis, Fern Caterpillar and many other insects.

Will Not—STAIN, DISCOLOR, nor BURN

HARMLESS TO MAN, PETS OR BIRDS

PACKED in 1 oz. Bottles, ½ pt. Tins, 1 qt. Tins, 1 gal. Tins

McCORMICK & CO.

Manufacturing Chemists

BALTIMORE, MD., U.S.A.

The New Spray for Aphis

DERRISOL

"IT KILLS APHIDS"

No Odor
Non Poisonous
Pleasant to Use
Does Not Require Soap
Mixes with Other Sprays
Can be used with Hard or Soft Water

Costs Less than others

Made Only by

WILLIAM COOPER & NEPHEWS

CHICAGO

PENETROL

AN ACTIVATOR FOR

Nicotine Spraying Solutions

Saves up to three-fourths of the nicotine usually required.

Does away with the use of soaps or other spreaders.

Has the following advantages over soaps:

- Standardized and uniform
- Free-flowing liquid
- Mixes readily with hard water
- Can be combined with Lead Arsenate
- Can be used with Bordeaux Mixture
- No heating water for dissolving soap
- No insoluble calcium soaps to clog the spray nozzle

NICOTROL

The correct combination of nicotine and Penetrol in one container.

A better control of aphis
At a lower cost of spray

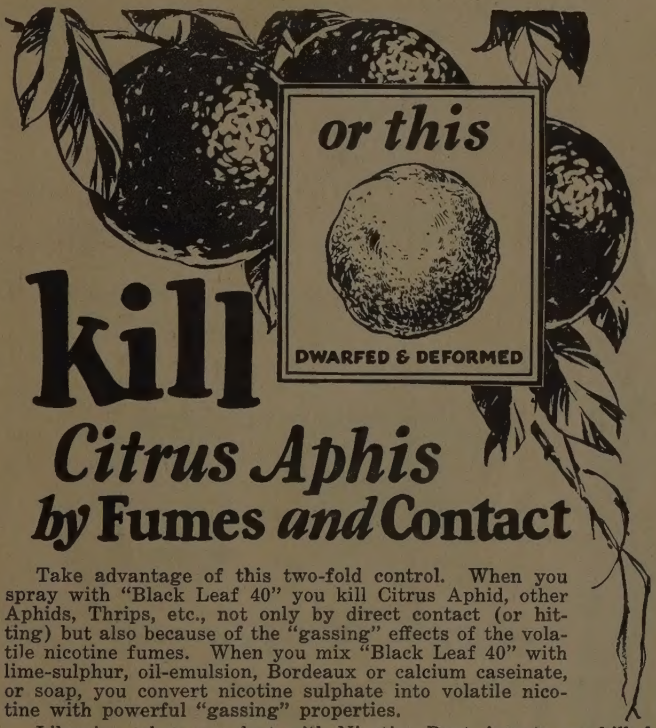
KAY LABORATORIES, Inc.

578 Madison Avenue, New York, N. Y.

District Manager for Florida
R. D. WHITMARSH
DeLand, Florida
Phone: DeLand 2404

USE "BLACK LEAF 40"

It Gives You Extra Insurance Against Aphis.



kill *Citrus Aphis* *by* Fumes *and* Contact

Take advantage of this two-fold control. When you spray with "Black Leaf 40" you kill Citrus Aphid, other Aphids, Thrips, etc., not only by direct contact (or hitting) but also because of the "gassing" effects of the volatile nicotine fumes. When you mix "Black Leaf 40" with lime-sulphur, oil-emulsion, Bordeaux or calcium caseinate, or soap, you convert nicotine sulphate into volatile nicotine with powerful "gassing" properties.

Likewise, when you dust with Nicotine Dust, insects are killed by actual contact of the dust with their bodies and also by the powerful nicotine gas.

"ASK YOUR EXPERIMENT STATION"

TOBACCO BY-PRODUCTS & CHEMICAL CORP.

LOUISVILLE, KENTUCKY
(Incorporated)

Kills Aphis

"Black Leaf 40"
40% Nicotine

Does Money Mean Anything to You?

PRESENT AVERAGE COST
OF APHID SPRAYING—

100 gallons water; ¾ pt. Black Leaf 40 at	$1.08
6 lbs. Fish Oil Soap	.60
Per 100 gallons	$1.68

NEW ECONOMICAL METHOD—

100 gallons water; So-Fyne Liquid Spreader, Sodium Oleate; 1/3 pt. Black Leaf 40	$0.46
2 qts. So-Fyne	.41
Per 100 gallons	$0.87

You Save 50% by Using SO-FYNE

If your local dealer cannot supply you
write direct

Adalink Chemical Company

290 Passaic Street -:- Newark, N. J.